

Listing of and Amendments to the Claims

The listing of claims below, wherein underlining indicates additions and strikethrough and double bracketing indicates deletions, will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) Laser apparatus for use in material processing of a workpiece, the apparatus comprising a coherent or partially coherent light source, a housing containing one or more focusing elements and a phase filter, the phase filter having a plurality of regions with each region being assigned a predetermined phase shift from a plurality of possible phase shifts, the phase shifts of the plurality of regions being chosen in dependence on a desired intensity distribution of light incident on the workpiece which extends in at least [[one]] a spatial dimension parallel to the optical axis beyond the focused spot produced by the apparatus in the absence of the filter.
2. (Currently amended) The laser apparatus as claimed in claim 1, wherein the phase filter is mounted in the pupil plane of the one or more focussing elements.
3. (Currently amended) The laser apparatus as claimed in either of claim 1, wherein the phase filter is provided in a removable cartridge that is removably mounted within the housing.
4. (Currently amended) Laser conditioning apparatus for use in material processing of a workpiece, the conditioning apparatus comprising an adapter housing containing a phase filter, the adapter housing having connection means for mounting the adapter housing between a coherent light source and one or more focusing elements, the phase filter having a plurality of regions with each region being assigned a predetermined phase shift from a plurality of possible phase shifts, the phase shifts of the plurality of regions being chosen in dependence on [[the]] a desired intensity distribution of light incident on the workpiece which extends in at least [[one]] a spatial dimension parallel to the optical axis beyond the focused spot produced by laser apparatus in the absence of the filter.

5. (Previously presented) The laser conditioning apparatus as claimed in claim 4, wherein the phase filter is a programmable spatial light modulator.
6. (Previously presented) The laser conditioning apparatus as claimed in claim 4, wherein each region of the filter has a phase shift of either 0 or π radians.
7. (Previously presented) The laser conditioning apparatus as claimed in claim 4, wherein the phase filter produces a desired three dimensional geometry of the light incident on the workpiece.
8. (Previously presented) The laser conditioning apparatus as claimed in claim 4, wherein the phase filter produces a plurality of separate intensity peaks.
9. (Currently amended) The laser apparatus as claimed in ~~any one of the preceding claims~~ claim 1, wherein the phase shifts of the plurality of regions of the filter are iteratively optimised with respect to the desired intensity distribution of the light incident on the workpiece.
10. (Currently amended) The laser apparatus as claimed in claim 9, wherein the phase shifts of the plurality of regions of the filter are iteratively optimised using a direct binary search.
11. (Currently amended) A method of manufacturing a phase filter for use in laser material processing apparatus, the method comprising the steps of: determining a desired intensity distribution of light incident on a workpiece which extends in at least [[one]] a spatial dimension parallel to the optical axis beyond the focused spot produced by the laser material processing apparatus in the absence of the filter; assigning initial respective phase shifts to a plurality of regions of the filter; determining an error factor with respect to the similarity of the intensity distribution generated using the assigned phase shifts to the desired intensity distribution; iteratively optimising the phase shifts assigned to each region so as to determine final phase shifts for each region of the filter; and generating a phase filter with a plurality of regions, each region having the final phase shift determined by the iterative optimisation step.

12. (Original) A method as claimed in claim 11, wherein the assigned phase shifts are iteratively optimised using a direct binary search.
13. (Currently amended) The laser ~~conditioning~~ apparatus as claimed in claim 1, wherein the phase filter is a programmable spatial light modulator.
14. (Currently amended) The laser ~~conditioning~~ apparatus as claimed in claim 1, wherein each region of the filter has a phase shift of either 0 or π radians.
15. (Currently amended) The laser ~~conditioning~~ apparatus as claimed in claim 1, wherein the phase filter produces a desired three dimensional geometry of the light incident on the workpiece.
16. (Currently amended) The laser ~~conditioning~~ apparatus as claimed in claim 1, wherein the phase filter produces a plurality of separate intensity peaks.